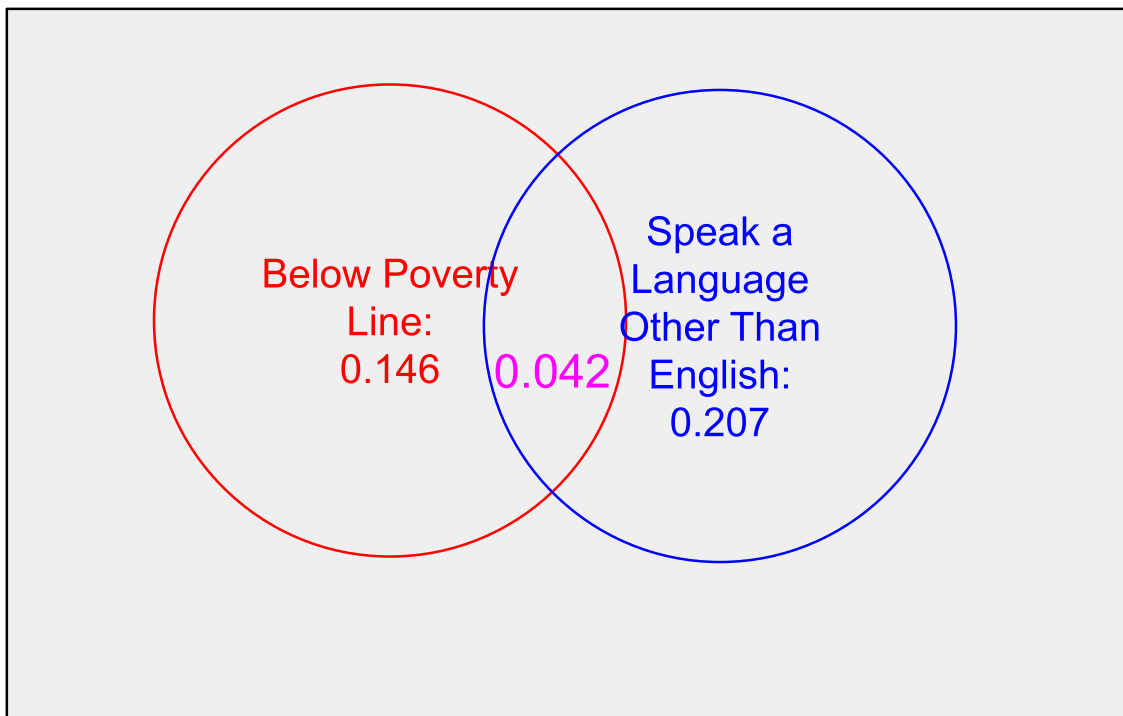# Homework 2

Mark Schulist

1.

a. No, 4.2 of people fall into both categories, so they are not disjoint.

b.

c.

live below poverty line $=$ B

only speak English $=$ E

$$P(B \cap E) = 0.042$$

d.

$$P(B \cup E) = P(B) + P(E) - P(B \cap E) = 0.146 + 0.207 - 0.042 = 0.311$$

e.

$$P(B^c \cap E) = P(B^c)P(E) = 0.854 \cdot 0.207 \approx 0.178$$

f.

$$P(B \cap E) = 0.042 P(B)P(E) = 0.03022$$

Because these are not equal, they are independent. Living below the poverty line and speaking a foreign language at home are not independent events and knowing one gives us some information about the other.

2.